

Part B – Technical Specifications

S. No.	PARTICULARS & TECHNICAL SPECIFICATION	
1	CONFIGURATION	Details
1.1	Construction	Electronic Pit Less Type, Microprocessor based Road Weigh Bridge.
1.2	Qty.	1 nos.
1.3	Codes & Standards	IS-1436, IS- 9281
1.4	Weighing Capacity	100 metric ton
1.5	Platform Size (minimum)	18 m x 3 m / 16m x 3m
1.6	No. of Trucks / trailers for weighment	100 Trucks / tractor / trailers per day
1.7	Type of trucks / trailers for weighment	18 wheeler
1.8	Platform height from ground level	Bidder to Specify
1.9	Ramp inclination ratio	Bidder to Specify
1.10	Mechanism / Principle	Electronic with Load Cells
1.11	No. of Load Cells	Minimum 08 Nos. (Bidder to Specify)
1.12	Weight Indication	Digital Indication System
1.13	Delivery location	PROJECT SITE
1.14	Control Room Size	3 m. X 3 m X 4 m (Ht.)
1.15	Load Cells Type	Compression type with multi columns, or double ended shear beam type hermetically sealed & vibration resistant
1.16	Number of load cells per weigh bridge	Minimum 08 Nos. each with rating of maximum safe over load capacity. Suitable compression must be built for temperature variation.
1.17	Maximum Safe over load protection	300 % of rated capacity
1.18	Maximum load for mechanical damage	400 % of rated capacity
1.19	Least count of the graduation	As per manufacturer standard
1.20	Weighing data storage capacity	Minimum 500 weighing
1.21	Digital weight indicator	To be provided to display weight (Microprocessor)
1.22	Printer	Inkjet Printer (A-3 Coloured)
1.23	Accuracy Required	±0.25 % of actual weight
1.24	Rating of each load cells	Minimum 2 times the rated weight divided by the number of load cells
1.25	Load cell protection	IP 68 and tested by a national test house and also have overload parameters
1.26	Visual display unit	Based on SMT technology to be provided in weight indicator
1.27	Location of PC / Printer	In the control room near weigh bridge
1.28	Totalizer	Minimum 6 digit type to be provided in the weigh bridge
1.29	Platform	Anti -skid steel
1.30	Digital weight indicator	At least 20 mm high character display for backlight LCD

		display
1.31	Display modes	Weight and 16 mm for message with a) Indicate weight b) Indicate calibration- calibration to be checked automatically every 5 minutes
1.32	Display of key board entered values	10 mm high characters
1.33	Indicator	Kg or Tonne
1.34	Protection	From electromagnetic and radio interference
1.35	PC Configuration	a) Processor: Core i7 Processor, 3.2 GHz b) RAM: 2GB DDR2 RAM c) Mother Board: Intel Express Chipset d) Graphics: On-board with min. 512 MB Video Memory e) Hard Drive: 1 no. X 360 GB SATA HDD @ 7200 RPM f) DVD R/W: 1 no. 52X CD RW & 16X DVD RW IDE Combo g) Ethernet Card: 2 nos. X 10/10/1000 MB h) Network Controller: 1 GbE NIC upgraded to 10 GbE i) Serial Port (RS232): 2 Nos. j) Parallel Port: 1 no. k) USB Port: 4 nos. l) Peripherals: 1 no. USB Optical Mouse, 1 no. USB Multimedia QWERTY Keyboard, 1 no. 22" Colour TFT/LCD Monitor m) OS: Windows 7 or latest n) MS Office 10 or latest
1.36	Weighment & printouts	1. Name of contractor 2. Date and Time 3. Serial Number 4. Product Code 5. Customer Code 6. Truck Registration Number 7. First (Gross) Weight (I) 8. Second (Tare) Weight (II) 9. Net (Pay load) Weight (III) 10. LXBXH (M) Weigh slip after every weighment (i.e.) I & II weighment. Built in clock provide date and time to printer. Facility for totalizing the different material received. The print out slip should contain the following details: a) BHEL Logo b) Ticket number and Date - auto generated. c) Vehicle Registration Number - up to 25 space alphanumeric and special characters. d) Tare Weight, Net Weight, Gross Weight - in kg, e) Date (DD/MM/YYYY) & Time (hh:mm:ss – 24 hour format) of each Weighment. f) Item Particulars / Description - minimum 32 characters comprising of space, alpha-numeric and special characters mode. g) Address of Transporter with Phone Number - 50

		characters. h) Invoice number (manually entered) - comprising of alphanumeric, space and special characters. i) Stores Dept. Code Number, Designation of persons for Weighing and Authority, etc. in a PRINTABLE FORMAT To be discussed in detail at the time of order finalization.
1.37	Report generation	Date wise, Vehicle wise, sorting data based on print out fields. Bidder to specify
2.0	BASIC DESIGN & CONSTRUCTIONAL FEATURES	
2.1	The basic design shall be suitable for electronic measuring system using load cells and digital indication system.	
2.2	The measuring accuracy shall be as per Class-III Accuracy and abided by Indian Weights & Measures Act.	
2.3	The weigh-bridge shall be of free motion strut mounted type construction.	
2.4	For a better and balanced weighing, the load cell should be suitably arranged for supporting the platform. Vendor to confirm and give details.	
2.5	The platform structure shall be fabricated type with welded rolled steel sections and plates of reputed make like SAIL, JINDAL, TISCO, etc. Bidder has to submit the details on the platform construction with outline drawings and material used, along with the offer. Thickness of Plate used for the platform to be specified.	
2.6	The fabricated platform structures are to be shot blasted prior to painting and finished with primer and epoxy coating of required Dry Film Thickness (DFT). Bidder to give details on paints applied and DFT.	
2.7	The platform plates are to be provided with "anti-skid ribbing" or made of chequered plates.	
2.8	Bolt-on type side railing with brackets are to be provided for the platform.	
2.9	Stoppers or bumpers are to be provided in longitudinal and transverse directions.	
2.10	The design of the weigh bridge shall be such that all the load cells can be accessed easily during maintenance/ breakdown.	
2.11	The weigh bridge indicator cum display system shall be compatible with a PC, for taking print-outs, data entry to hard disk of the PC and giving connectivity to external IT network system through suitable and reliable Communication cables and ports.	
3	LOAD CELL DETAILS	
3.1	Rated Capacity of each Load Cell (metric ton)	Bidder to Specify
3.2	Type of Load cell	Compression type Bidder to specify and give complete details
3.3	Load cell technology	Analog / Digital Bidder to Specify and give complete details
3.4	Make & Model no.	Bidder to Specify
3.5	Accuracy Level	In the order of 0.02% Bidder to Specify
3.6	Electrical Input Supply [Minimum & Maximum]	Bidder to Specify
3.7	External Communication	Bidder to Specify
3.8	Output Resolution	Bidder to Specify
3.9	Output Update Rate	In the order of 10 readings per second. Bidder to specify
3.10	Repeatability	Bidder to Specify
3.11	Overload Rating (Safe)	Not less than 125% of rated

		capacity. Bidder to Specify
3.12	Overload Rating (Ultimate)	Not less than 250% of rated capacity. Bidder to Specify
3.13	Sensitivity in mV/V	2.0 ± 0.1%
3.14	Operating Temperature Range	10°C to 50°C
3.15	Temperature Effect on Sensitivity	Bidder to Specify
3.16	Temperature Effect on Zero Balance	Bidder to Specify
3.17	Protection Class	IP 67/IP 68
3.18	Citation (For Test Certificate)	OIML R60
3.19	Creep in 30 min.	Bidder to Specify
3.20	Shall be unaffected by 'off-centre' loads	
3.21	Canister design to be strong enough to withstand wear, tear and accidental damage due to harsh usage	
3.22	Shall be hermetically sealed.	
3.23	Shall be provided with automatic diagnostics	
3.24	Shall withstand hostile conditions due to extreme temperatures, lightning, wind, shock and vibration	
3.25	Shall be provided with over-load protection	
3.26	Shall be provided with 'low-torque' anti-rotation load button	
3.27	Shall be provided with water-proof connectors	
3.28	Test Certificate for Load Cell's Accuracy Test conducted from reputed laboratory is required	
4.0	DIGITAL INDICATION SYSTEM	
4.1	Make & Model no.	Bidder to Specify
4.2	Processor	Micro-Processor based [Bidder to specify make and model]
4.3	Processor Clock	Bidder to specify
4.4	Real Time Clock	On Board Battery Backed
4.5	Memory	For data storage, capable of storing around 1500 weighment records with battery back-up. Bidder to specify the memory storage capacity.
4.6	Power Supply	Switched Mode Power Supply
4.7	Input Voltage	230 V AC, 50 Hz
4.8	Protection	
4.8.1	Fuse of suitable rating for	Bidder to specify

	Input AC Mains.	
4.8.2	Input Line Filter for EMI and RFI Suppressions.	Bidder to confirm
4.8.3	Spike Suppressors for input transits.	Bidder to confirm
4.8.4	High voltage protectors.	Bidder to confirm
4.8.5	Degree of Resistance to dirt and moisture.	Vendor to specify the IP (Ingress Protection) number
4.8.6	Splash proof keypad	Bidder to specify
4.9	Power Consumption (Watts)	Bidder to specify
4.10	A/D Conversion	Bidder to furnish details
4.11	Load-Cell Excitation	Bidder to furnish details
4.12	Repeatability	± 0.01% of Full Scale
4.13	Display	A suitable Illuminated Display (with Backlight) for displaying numerals as well as alphabets, at any time.
4.14	Remote Display	Remote Display port to connect to red LED seven segment display to indicate weight on the platform
4.15	Reading Capacity of Display unit	Minimum 120 metric ton (i.e. 20 metric ton above the rated capacity of the weigh bridge) Vendor to specify
4.16	Features	Configurable Decimal points Flicker free display of weight Configurable Zero tracking Over & Under Range Indication Character height (mm) Number of digits Vendor to specify
4.17	Printer Port	Compatible for connecting dot matrix / laser printer for printing of weighment records and reports
4.18	Serial Port / Ethernet	RS-232 Serial Port for computer interfacing or driving remote display and provision of Ethernet to Net Connectivity. Bidder to specify
5.0	WEIGHBRIDGE SOFTWARE	
5.1	The OFFER shall also include the SOFTWARE required to integrate the functions of the Hardware with the Operations of the Weigh-Bridge offered. Bidder to specify the software capability to interface with SAP or other software at BHEL. NOTE: Bidder to list down the technical features / functions of the SOFTWARE in detail	
5.2	Software for SMART CALIBRATION (minor weigh correction by software) shall be provided by	

	the vendor. In addition to Software for pre-start data entry for loading details, date & time, location, etc. Bidder to specify.	
6.0	Hardware	The Bidder has to list down the Hardware required to be supplied to assure the specified functions from the weigh-bridge offered.
7.0	Additional Features	Bidder to list down the list of additional features available in the OFFERED Weight Bridge & Control Unit.
8.0	LIGHTING SYSTEM - A spot light with sufficiently long cable shall also be provided for 24 V AC supply.	
9.0	UN-INTERRUPTED POWER SUPPLY UNIT (UPS)	
9.1	UPS of suitable rating with maintenance free dry batteries shall be provided for operations lasting over three continuous hours.	
9.2	Make. : APC / MICROTEK / AMARON or any other reputed make acceptable to BHEL	
9.3	Model & Rating (kVA): Bidder to specify	
9.4	Catalogue of the UPS and battery shall be submitted with the Technical Offer.	
9.5	Spares Package for the UPS for 2 years working also shall be offered.	

10.0	IMPORTANT POINTS
10.1	VOID
10.2	All electrical equipment shall be tropicalized and shall have IP 54 degree of protection
10.3	All electrical control cabinets & panels should be dust and vermin proof
10.4	Vendor should ensure the proper Earthing for the machine and its accessories. Bidder has to ensure the works relating to the running of earth flat from all the load cells used, and connecting to the common earth pit provided for the subject weigh bridge. This complete work is under the scope of the Bidder.
11.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE
11.1	The machine shall be suitable for an ambient temperature of around 50 C and relative humidity of 95 % respectively, but both do not occur simultaneously.
11.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year.
11.3	Paint of the machine shall be weather resistant and shall not peel off due to weathering.
11.4	Vendor to ensure that the Thermal Stability of the complete machine to be designed keeping in view the specified Ambient Conditions and accuracy requirements of BHEL for trouble free operation of the weighing machine.
	If any safety / environmental protection enclosure is required it shall be built in the weighing machine by the vendor.
12.0	MACHINE SPARES

12.1	Load Cell – 2 nos. Digital Indicating System – 1 set. Remote Display Unit – 1 No. Itemized break-up of mechanical and electrical spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on two shifts continuous running basis should be offered by vendor. Unit Price of each item of spare shall be offered.
12.2	Electrical: All types of Relays/Contactors/Push Buttons, Indicating Lamps/Fuses, and PCBs shall be quoted.
12.3	All types of spares for total machine and accessories should be available for at least ten years after supply of the weighing machine.
13.0	DOCUMENTATION: THREE sets of following documents (Hard Copies) in English language shall be supplied along with machine
13.1	Operating Manuals of Weighing Machine and Indicator System
13.2	Programming Manuals for the Weighing Machine
13.3	Detailed Maintenance Manual (for troubleshooting and service) of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Mechanical and Instrumentation circuit diagrams. Technical Manual & Data sheet for Load cell, Indicating system and other components
13.4	Complete back-up of hard disk / software on GHOST CD and clear written Instructions (3 copies) to take back-up and reloading of a new hard disk.
13.5	One additional set of all the above documentation on CD ROM, wherever possible.
14.0	MACHINE FOUNDATION
14.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within ONE WEEK from the date of issue of BHEL Purchase Order. Vendor shall submit complete foundation details including static and dynamic loads within a month after getting BHEL's approval. The layout should consist of all requirements pertaining to complete weighing machine including control room.
15.0	INSPECTION & MACHINE ACCEPTANCE
15.1	Pre-dispatch inspection - Machine shall be offered for inspection at vendor's works by BHEL engineers. Vendor to confirm
	Vendor to give details on MACHINE INSPECTION Tests to be performed by Vendor at Vendor's works, on the machine, before dispatch.
15.1.1	Full load test to demonstrate the maximum capacity of the weighing machine. (If possible)
15.1.2	Demonstration of all features of the weighing machine, indicator system & accessories
15.1.3	Travel, board & lodging for the BHEL Engineers who will be visiting vendor's works for pre-dispatch inspection, shall be borne by BHEL. Vendor to note.
15.2	Tests / Activities to be carried out by Vendor at BHEL works while commissioning the machine:
15.2.1	Accuracy, Repeatability, Safe Over-Load Testing, Communication Connectivity and tests recommended by the Vendor